Appendix D:
PrintSTEP Air Levels: Material Use Tables

Appendix D includes:

- ◇ An Example Materials Use Worksheet
- ◇ More information on the Materials Use Air Levels Tables

EXAMPLE Materials Use Worksheet

①	②	③
Printing Process	**VOC-containing materials**	**Qty VOC-containing materials** used in the last 12 mo.
Rotogravure with solvent-based inks	inks	AB white ink 10,000 lbs
		GJ's blue 30x 8,000 lbs
	dilution & cleaning solvent	AB solvent 1,000 lbs
	adhesives & coatings	Super adhesive 2,000

VOC Total **21,000 lbs**

Now use the Worksheet totals to determine the PrintSTEP VOC Level. Using the Materials Use Air Level Table below, find the Level associated with the total VOC-containing material used, as recorded in the "VOC Total" box. Write that Air Level in Box 1. **It's 21,000 lbs in the example.** Assume this example facility is a rotogravure printer using solvent-based inks, therefore use the second column in the table to find the Air Level.

Material Use Air Level Table for VOCs -

Sheetfed Offset or Nonheatset Web Lithography, or Screen Printing	**Heatset Web Offset Lithography (uncontrolled), or Flexography or Rotogravure with solvent-based inks**	**Flexography or Rotogravure with water-based inks***	**Air Level**
less than 1,425 gals	less than 10,000 lbs	less than 40,000 lbs	Level 1
1,425 - 3,560 gals	10,000 - 25,000 lbs	40,000 - 100,000 lbs	Level 2
3,560 - 7,125 gals	25,000 - 50,000 lbs	100,000 - 200,000 lbs	Level 3
7,125 - 14,250 gals	50,000 - 100,000 lbs	200,000 - 400,000 lbs	Level 4
more than 14,250 gals	more than 100,000 lbs	more than 400,000 lbs	Level 5

* A water-based ink contains no more than 25% of the volatile fraction as VOCs.

Check one:	Your VOC LEVEL is:
❑	VOC Level 1
✓	**VOC Level 2**
❑	VOC Level 3
❑	VOC Level 4
❑	VOC Level 5

More information on PrintSTEP Materials Use method for determining Air Levels

Why was the Materials Use method developed?
The Materials Use method was developed to help you quickly and easily determine your facility's PrintSTEP Air Level. To complete your PrintSTEP application, you must determine your Air Level, either using the Materials Use method in Chapter 6 **or** the Emissions Calculations method in Appendix E. Both methods help you estimate emissions, but the Materials Use method provides a handy shortcut for many printers.

The Materials Use method allows you to determine your facility's PrintSTEP Air Level based on your facility's material usage for the last 12 months. By assuming that a facility's air emissions are the result of the materials used by that facility, the Materials Use method translates material used into air emissions. This method provide a conservatively high estimate of your air emissions.

Who can use the Materials Use method?
The Materials Use method only works for those printers who use ONE type of printing process at their facility. The types of printing processes defined by PrintSTEP are:

- Sheetfed or Nonheatset Web Offset Lithography
- Heatset Web Offset Lithography
- Screen Printing
- Flexography or Rotogravure Printing Using Water-based or Solvent-based Inks

NOTE!! Printers who use MORE THAN ONE type of printing process at their facility must use the Emissions Calculations method in Appendix E to estimate emissions. In addition, printers who want credit for the reductions resulting from their pollution control devices must use the Emissions Calculations method.

NOTE!! Printers must use the Emissions Calculations method instead of the Materials Use method if 10% or more of their facility's total Volatile Organic Compound (VOC) or Hazardous Air Pollutant (HAP) emissions come from products not listed on the Materials Use Worksheet in Chapter 6.

How does the Materials Use method provide a conservatively high estimate of emissions?

- The Materials Use method was developed using the most conservative assumptions to provide a safety margin. For example, the method assumes that 100% of press cleaners evaporate. In reality, often much less than 100% of the wash actually evaporates.
- Conservative assumptions are used so you can be sure the Materials Use method will not *underestimate* your emissions, provided you do not increase production (e.g., increased hours of operation). If anything, it will *overestimate* your air emissions.
- If you use the Materials Use method and find you are a Level 1 facility (the lowest level), you can be certain you are in the right level. Even with overestimated emissions, you're in the level with the fewest regulatory requirements.
- The Materials Use method is a quick tool to estimate air emissions, but it does not account for factors such as low-VOC cleaners, or pollution control equipment.
- If you use the Materials Use method and find you are in Level 2 or higher, you may want to use the Emissions Calculations method instead because the Materials Use method might be overestimating your emissions.
- Many printing facilities are small sources of air emissions that will be in Level 1 using the Materials Use method. This is why the Materials Use method can be really helpful; it gives the majority of printers a quick way to estimate their air emissions.

The Emissions Calculations method in Appendix E

The Emissions Calculations method allows you to account for factors that reduce your air emissions and are not accounted for in the conservative assumptions used in the Materials Use method. If you are using pollution control equipment or low-VOC cleaners or inks, you may find you are in a lower level using the Emissions Calculations method. See the example below.

Using Emissions Calculations Method to Account for Low VOC Inks

A flexographic printer uses 500,000 pounds of water-based inks per year. Using the Materials Use method, this printer is in VOC Level 5. The Materials Use method makes the conservative estimate that water-based inks have a VOC content of 25%. In reality, this printer's inks only have a 5% VOC content. Because of this difference in actual and assumed VOC content, the Materials Use method overestimates this printer's emissions. Using the Emissions Calculations method, however, the printer can get full credit for their low VOC ink. The Emissions Calculations method shows that the printer is in VOC Level 4 for air emissions, and with the lower level come fewer regulatory requirements.

What assumptions were made in developing the Materials Use method?

1. The gallons of HAP-containing materials used (2,667 gallons [20,000 pounds] or 6,667 gallons [50,000 pounds]) are based upon 2-butoxyethanol as the representative HAP, which weighs 7.5 lbs/gallon, all evaporated.
2. "Cleaning solvent" density is assumed to be 7.0 lbs/gallon, 100% VOC, and all evaporated.

3. "Fountain solution additives" include isopropyl alcohol, n-propyl alcohol, n-butanol, and alcohol substitutes. The weight of isopropyl alcohol is 6.6 lbs/gallon, but for the table is assumed to be 7.0 lbs/gallon and 100% VOC.
4. The water-based inks, water-based coatings and water-based adhesives are assumed to contain no more than 25% of the volatile fraction as VOC and all is assumed to evaporate. (Control Techniques Guidelines for Graphic Arts--Rotogravure and Flexography. EPA-450/2-78-033).
5. "Adhesives" and "Coatings" for solvent-based operations are assumed to weigh 7.0 lbs/gallon, 100% VOC, and all evaporated.